SmartSwitch 9000-6 Slot
9C306 System Monitor
User's Guide

9031994-01

CABLETRON SYSTEMS

Notice

Cabletron Systems reserves the right to make changes in specifications and other information contained in this document without prior notice. The reader should in all cases consult Cabletron Systems to determine whether any such changes have been made.

The hardware, firmware, or software described in this manual is subject to change without notice.

IN NO EVENT SHALL CABLETRON SYSTEMS BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO LOST PROFITS) ARISING OUT OF OR RELATED TO THIS MANUAL OR THE INFORMATION CONTAINED IN IT, EVEN IF CABLETRON SYSTEMS HAS BEEN ADVISED OF, KNOWN, OR SHOULD HAVE KNOWN, THE POSSIBILITY OF SUCH DAMAGES.

© January 1999 by:

Cabletron Systems, Inc.
35 Industrial Way
Rochester, NH 03867

All Rights Reserved
Printed in the United States of America

Order Number: 9031994-01

Cabletron Systems and **LANVIEW** are registered trademarks, and **SmartSwitch** is a trademark of Cabletron Systems, Inc.

i960 microprocessor is a registered trademark of Intel Corp.

Ethernet is a trademark of Xerox Corporation.

FCC Notice

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment uses, generates, and can radiate radio frequency energy and if not installed in accordance with the operator's manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

WARNING: Changes or modifications made to this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

VCCI Notice

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

この装置は，情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Industry Canada Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Declaration of Conformity Addendum

Application of Council Directive(s):	**89/336/EEC** **73/23/EEC**
Manufacturer's Name:	**Cabletron Systems, Inc.**
Manufacturer's Address:	**35 Industrial Way** **PO Box 5005** **Rochester, NH 03867**
European Representative Name:	**Mr. J. Solari**
European Representative Address:	**Cabletron Systems Limited** **Nexus House, Newbury Business Park** **London Road, Newbury** **Berkshire RG13 2PZ, England**
Conformance to Directive(s)/Product Standards:	**EC Directive 89/336/EEC** **EC Directive 73/23/EEC** **EN 55022** **EN 50082-1** **EN 60950**
Equipment Type/Environment:	**Networking Equipment, for use in a Commercial or Light Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

Mr. Ronald Fotino	Mr. J. Solari
Full Name	Full Name
Principal Compliance Engineer	Managing Director - E.M.E.A.
Title	Title
Rochester, NH, USA	Newbury, Berkshire, England
Location	Location

Contents

Chapter 1 Introduction

Features 1-1
Related Manuals 1-3
Getting Help 1-4

Chapter 2 Installing the 9C306 System Monitor

Chapter 3 9C306 System Monitor Operation

Monitoring Functions 3-1
Fan Status 3-1
System Voltages 3-2
LANVIEW LED 3-2
Out-of-Band Management 3-3
COM1 and COM2 Ports 3-4
The Ethernet Port Interface Module (EPIM) 3-4

Chapter 4 Specifications

Safety 4-1
EMC 4-1
Service 4-1
Physical 4-2
Environmental 4-2

Appendix A EPIM Specifications

Introduction A-1
EPIM-T A-1
EPIM-F2 ..... A-2
EPIM-F3 ..... A-4
EPIM-A and EPIM-X (AUI Port) A-6

Appendix B Uninterruptible Power Supply (UPS)

Introduction B-1
Connecting a UPS to the System Monitor Module B-1
Configuring COM Port for UPS B-2
Monitoring UPS B-3

Chapter 1

Introduction

The 9C306 System Monitor, shown in Figure 1-1, provides out-of-band management capabilities, and environmental/power monitoring for the SmartSwitch 9000-6 Slot System. The System Monitor Module is inserted into a SmartSwitch 9000-6 chassis in the slot marked SM in the right side of the module card cage.

Features

Out-of-Band Management

Out-of-band management refers to managing the SmartSwitch 9000-6 Slot via a Local Management (LM) connection or an SNMP-based management application which does not use the same network connection to the chassis as "user data."

Three out-of-band management interfaces are built into the 9C306 System Monitor. Two interfaces are serial RS232 ports. These ports support local management via a VT100 session, Serial Line Internet Protocol (SLIP), or Point-to-Point (PPP), or monitor an American Power Conversion Uninterruptible Power Supply (UPS).

The remaining out-of-band management interface supports any standard Cabletron Systems Ethernet Port Interface Module (EPIM). This interface provides a direct connection to the internal System Management Bus-10 (SMB-10).

Environmental/Power Monitoring

The 9C306 System Monitor monitors and reports chassis power parameters, as well as the presence of the chassis cooling fan.

Flash EEPROM

The capability of downloading future firmware upgrades has been built into the 9C306 System Monitor.

Figure 1-1. The 9C306 System Monitor

Hot Swapping

The 9C306 System Monitor can be removed from the chassis while the SmartSwitch 9000-6 Slot is running without interrupting network performance.

LANVIEW LED

The STATUS LED is built into the front of the 9C306 System Monitor. This LED indicates the status of the System Monitor and the presence or absence of system alarms.

Related Manuals

The manuals listed below should be used to supplement the procedures and technical data contained in this manual.

Cabletron Systems *SmartSwitch 9000-6 Slot 9C106 Chassis Setup and Installation Guide*

Cabletron Systems *SmartSwitch 9000 Module Local Management User's Guide*

In addition, each Interface Module has a specific user's guide and Local Management Appendix.

Getting Help

For additional support related to this device or document, contact Cabletron Systems using one of the following methods:

World Wide Web	http://www.cabletron.com/
Phone	(603) 332-9400
Internet mail	support@cabletron.com
FTP Login Password	ftp://ftp.cabletron.com/ *anonymous* *your email address*
To send comments or suggestions concerning this document, contact the Cabletron Systems Technical Writing Department via the following email address: **TechWriting@cabletron.com** *Make sure to include the document Part Number in the email message.*	

Before calling Cabletron Systems, have the following information ready:

- Your Cabletron Systems service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- The serial and revision numbers of all involved Cabletron Systems products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)
- Any previous Return Material Authorization (RMA) numbers

Chapter 2

Installing the 9C306 System Monitor

The 9C306 System Monitor is installed in the slot marked SM at the right front side of the SmartSwitch 9000-6 Slot chassis, as shown in Figure 2-1.

Install a System Monitor by following the steps below:

Before handling the System Monitor Module or any SmartSwitch 9000 Interface Modules, attach the ESD (Electrostatic Discharge) Wrist Strap. Then observe all static safety precautions to prevent damage from ESD when handling the modules.

1. Unpack the System Monitor Module by removing it from the shipping box and sliding the two foam end caps off the unit. (Save the shipping box and packing materials in the event the System Monitor must be reshipped.)
2. Remove the System Monitor Module from the protective plastic bag. Observe all precautions to prevent damage from Electrostatic Discharge (ESD). (Save the bag in the event the System Monitor must be reshipped.)
3. Remove the plastic protective cap that covers the connector on the rear of the System Monitor Module.
4. Examine it carefully, checking for damage. If any damage exists, DO NOT install it. Immediately contact Cabletron Systems for Technical Support.
5. Install the System Monitor Module in the chassis slot marked SM, as shown in Figure 2-1. Slide the module between the module guides. Take care that the module slides in straight and properly engages the backplane connectors. Lock down the plastic tabs at the top and bottom of the module.

If the SmartSwitch 9000-6 Slot chassis has been powered up, the 9C306 System Monitor illuminates the STATUS LED.

If the Status LED is any color other than green, refer to Chapter 3 for a description of the status.

If the SmartSwitch 9000-6 Slot chassis has not been powered up, make sure that all modules have been properly installed; then power up the SmartSwitch 9000-6 Slot chassis by following the steps in the *SmartSwitch 9000-6 Slot 9C106 Chassis Setup and Installation Guide.*

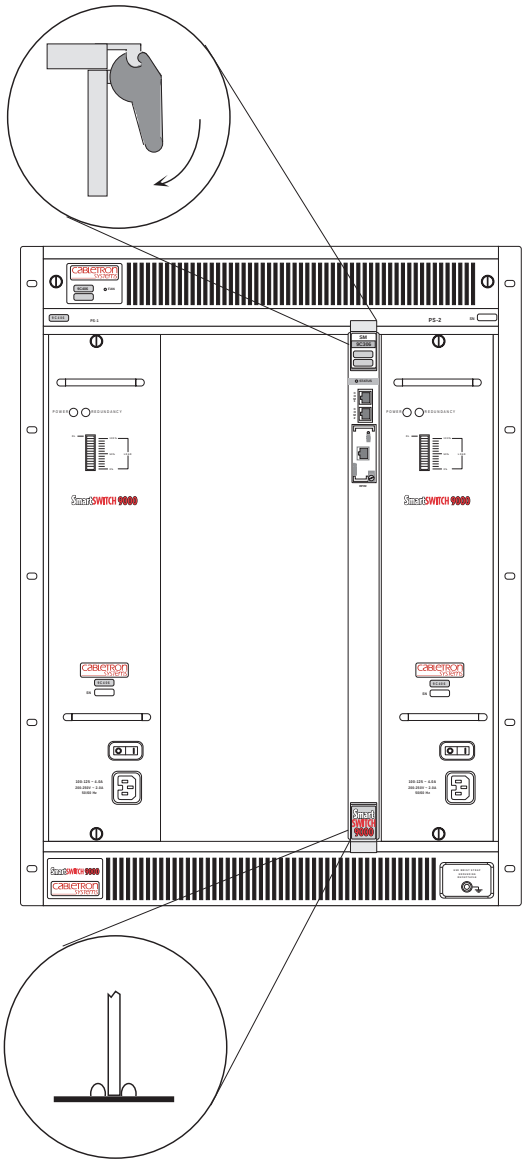


Figure 2-1. Installing the System Monitor

Chapter 3

9C306 System Monitor Operation

The 9C306 System Monitor, monitors several chassis environmental parameters, provides multiple out-of-band management interfaces, as well as verification of system cooling. The System Monitor also includes LANVIEW LED for at-a-glance diagnostics.

Monitoring Functions

The 9C306 System Monitor Module monitors the following SmartSwitch 9000 functions:

- Fan status
- System voltages

Fan Status

The System Monitor Module monitors the operational status of the 9C406 Fan Module, which maintains airflow through the chassis. The System Monitor reports the fan tray status conditions listed in Table 3-1.

Table 3-1. Fan Tray Conditions

Condition	Description
Installed	The Fan Tray Module is installed in the SmartSwitch 9000-6 Slot chassis.
Not Installed	The System Monitor has not detected a Fan Tray Module in the chassis.
Normal	The Fan Tray Module is operating properly.
Fault	A malfunction in the operation of the Fan Tray Module has been detected.

System Voltages

The 9C306 System Monitor monitors specific system power parameters to ensure that they are within acceptable limits. The power parameters monitored from the backplane are the 48-volt DC System Power Bus and the INB Termination Power Bus. The power parameter monitored within the System Monitor is the 12-volt internal line. The results of the monitoring are available to the network manager via remote management. Voltages above or below the acceptable voltage limits cause an alarm to be sent to the network manager. Table 3-2 summarizes these acceptable voltage limits.

Table 3-2. Acceptable Voltage Limits

Description	Acceptable Voltage Limits
48-volt DC System Power Bus	From 40 volts to 59 volts
INB Termination Power Bus	From 3.1 volts to 5 volts
12-volt internal line	From 11 volts to 13 volts

LANVIEW LED

The LANVIEW LED on the front of the 9C306 System Monitor Module is an aid in troubleshooting.

There is one LED visible to the user (Figure 3-1), which is the STATUS LED.

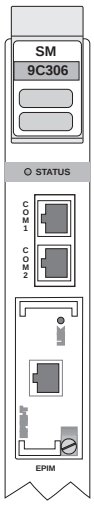


Figure 3-1. 9C306 System Monitor LANVIEW LED

The STATUS LED indicates the current status of the System Monitor processor and peripherals. The possible states and descriptions of the STATUS LED are listed in Table 3-3.

Table 3-3. STATUS LED

LED Color	State	Description
Green	Functional	Fully operational.
Yellow/Green	Booting	Flashes green and yellow while booting.
Yellow	Testing	Testing system.
Yellow (Flashing)	Crippled	Not fully operational.
Red	Reset	Normal power-up reset.
Red (Flashing)	Failed	Fatal error has occurred.
Off	Power off	Lack of 5-volt input to the System Monitor.

Out-of-Band Management

Out-of-band management refers to managing the system via a Local Management (LM) connection or an SNMP-based management application which does not use the same network connection to the chassis as “user data.”

The 9C306 System Monitor provides three out-of-band management interfaces for managing the SmartSwitch 9000 system. These interfaces are listed below:

- Two serial communication ports, COM1 and COM2
- One standard Cabletron Systems EPIM interface

COM1 and COM2 Ports

The 9C306 System Monitor front panel has two RJ45 communication ports for RS232 serial communication to and from the SmartSwitch 9000-6 Slot. Figure 3-2 illustrates a single RJ45 communication port. COM2 can be configured to run the Serial Line Internet Protocol (SLIP), Point-to-Point Protocol (PPP), Local Management via a terminal or modem connection, or monitor an American Power Conversion Smart UPS. Refer to the SmartSwitch 9000-6 Slot *Module Local Management User's Guide* for detailed information on configuring the COM2 port.

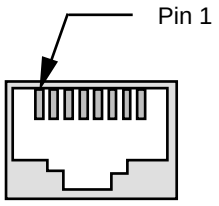


Figure 3-2. RJ45 Communication Port Connector

Table 3-4 details the pinout connections for an RJ45 communication port connector.

Table 3-4. Pinout Connections RJ45 Communication Port Connector

Pin	Description
1	TRANSMIT
2	DATA CARRIER DETECT
3	DATASET READY
4	RECEIVE
5	SIGNAL GROUND
6	DATA TERMINAL READY
7	REQUEST TO SEND
8	CLEAR TO SEND

The Ethernet Port Interface Module (EPIM)

The 9C306 System Monitor provides a port for Cabletron Systems EPIMs. The EPIM provides a direct connection to the internal SMB-10 bus. This connection can be used for out-of-band graphical SNMP management of the SmartSwitch 9000-6 Slot system or a Telnet session into local management. Any standard Cabletron Systems EPIM can be installed. Refer to Appendix A for detailed information on the EPIM.

Chapter 4

Specifications

Safety

The 9C306 System Monitor, when properly installed in the SmartSwitch 9000-6 Slot chassis, complies with the following safety specifications and standards.

- UL 1950
- CSA C22.2 No. 950
- EN 60950
- IEC 950
- 73/23/EEC

EMC

- FCC Part 15
- EN 55022
- VCCI V-3
- EN 50082-1
- 89/336/EEC

Service

The 9C306 System Monitor is designed with the following service capability:

MTBF (MIL-STD-217): >200,000 hours projected

MTTR: <.50 hour

Physical

Dimensions
48.3 H x 30.5 W x 36.8 D centimeters
(19 H x 1.2 W x 14.5 D inches)

Weight

Unit:	2.27 kilograms (5 pounds)
Shipping:	2.27 kilograms (5 pounds)

Environmental

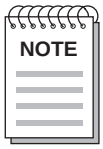
Operating Temperature:	5° to 40°C (40° to 104°F)
Operating Humidity:	5% to 95% non-condensing

Appendix A

EPIM Specifications

Introduction

The 9C306 System Monitor provides a port for Cabletron Systems EPIMs. EPIMs allow connection to the main network using different media types. Cabletron Systems offers a variety of EPIMs. Specifications for these EPIMs are detailed in the following sections.



Verify that the EPIM is the proper revision number before installing. Refer to Chapter 3, The Ethernet Port Interface Module (EPIM) section for detailed information on version numbers.

EPIM-T

The EPIM-T is an RJ45 connector supporting UTP cabling. It has an internal Cabletron Systems TPT-T 10BASE-T Twisted Pair Transceiver.

The slide switch on the EPIM-T determines the crossover status of the cable pairs. If the switch is on the **X** side, the pairs are internally crossed over. If the switch is on the = side, the pairs are not internally crossed over. Figure A-1 shows the pinouts for the EPIM-T in both crossover positions.

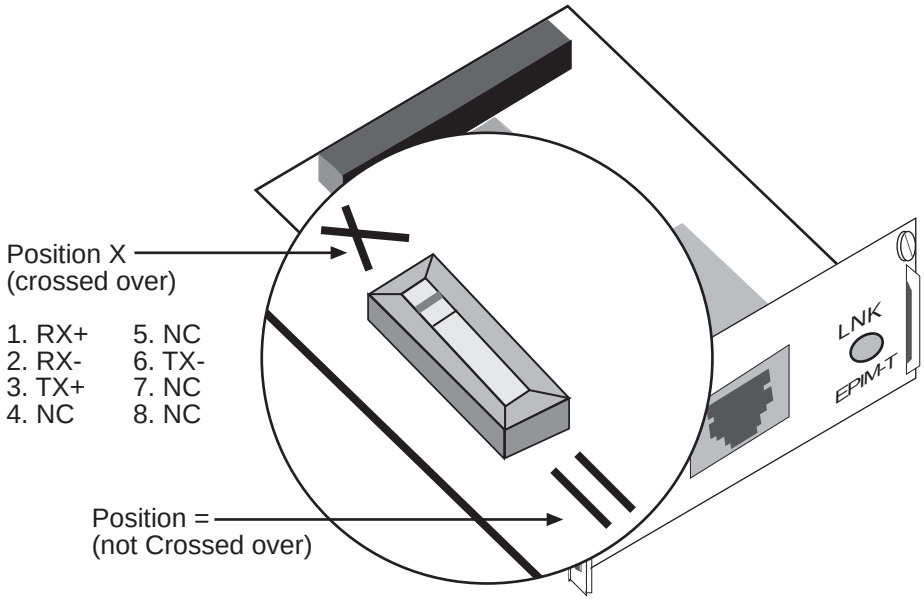


Figure A-1. EPIM-T Crossover Switch

EPIM-F2

The EPIM-F2 supports Multimode Fiber Optic cabling. Each EPIM has an internal Cabletron Systems FOT-F Fiber Optic Transceiver. The EPIM-F1 is equipped with SMA Connectors and the EPIM-F2 is equipped with ST Connectors. Figure A-2 shows both EPIMs. Specifications for the EPIMs are listed in Table A-1.

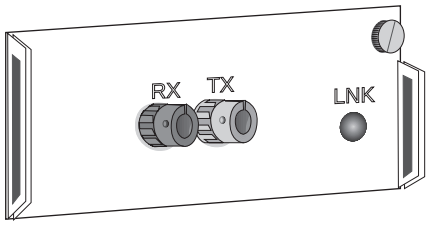


Figure A-2. EPIM-F2

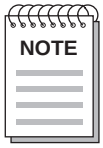
Table A-1. EPIM-F2 Receiver Specifications

Parameter	Typical Value	Worst Case	Worst Case Budget	Typical Budget
Receive Sensitivity	-30.5 dBm	-28.0 dBm	—	—
Peak Input Power	-7.6 dBm	-8.2 dBm	—	—

Transmitter power parameters are listed Table A-2.

Table A-2. EPIM-F2 Transmitter Specifications

Parameter	Typical Value	Worst Case	Worst Case Budget	Typical Budget
50/125 μm fiber	-13.0 dBm	-15.0 dBm	13.0 dB	17.5 dB
62.5/125 μm fiber	-10.0 dBm	-12.0 dBm	16.0 dB	20.5 dB
100/140 μm fiber	-7.0 dBm	-9.0 dBm	19.0 db	23.5 dB
Error Rate	Better than 10^{-10}			



The transmitter power levels and receive sensitivity levels listed are Peak Power Levels after optical overshoot. A Peak Power Meter must be used to correctly compare the values given above to those measured on any particular port. If Power Levels are being measured with an Average Power Meter, then 3 dBm must be added to the measurement to correctly compare those measured values to the values listed (i.e., -30.5 dBm peak=-33.5 dBm average).

EPIM-F3

The EPIM-F3 supports Single Mode Fiber Optic cabling. It has an internal Cabletron Systems FOT-F Fiber Optic Transceiver and is equipped with ST Connectors. Figure A-3 shows the EPIM-F3. Specifications for the EPIM-F3 are listed in Figure A-4 and Table A-3.

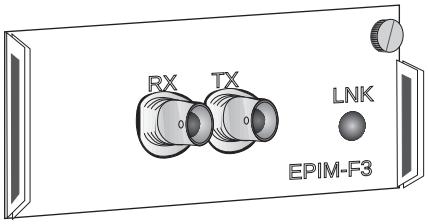


Figure A-3. EPIM-F3

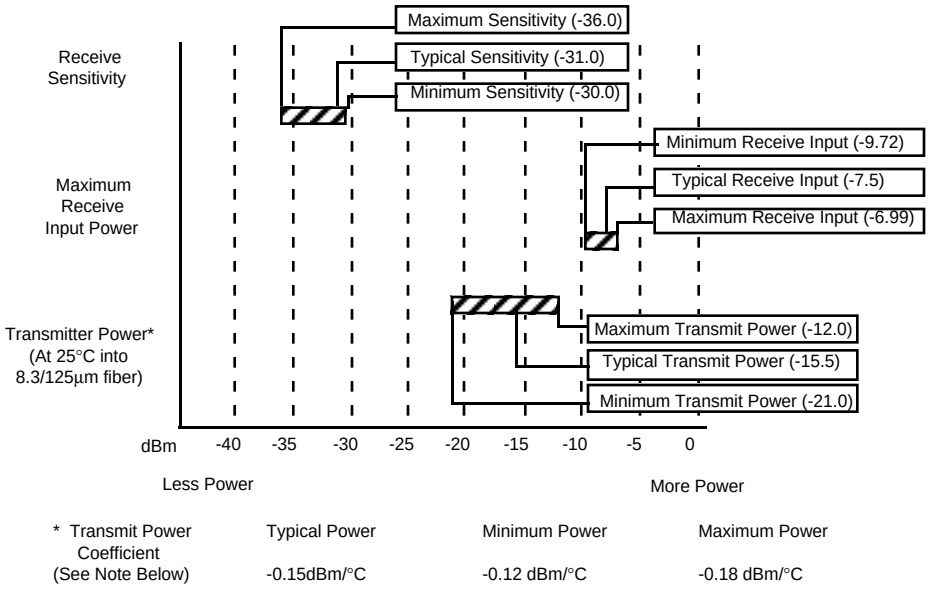
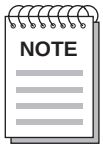


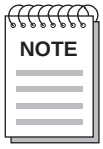
Figure A-4. EPIM-F3 Power and Sensitivity Specifications



Transmitter Power decreases as temperatures rise and increases as temperatures fall. Use the Output Power Coefficient to calculate increased or decreased power output for your operating environment. For example, the typical power output at 25° C is -16.4 dBm. For a 4° C temperature increase, multiply the typical coefficient (-0.15 dBm) by four and add the result to typical output power (4 x -0.15 dBm + -16.4 = -17.0).

Table A-3. EPIM-F3 Specifications

Parameter	Typical	Minimum	Maximum
Transmitter Peak Wave Length	1300 nm	1270 nm	1330 nm
Spectral Width	60 nm	-	100 nm
Rise Time	3.0 nsec	2.7 nsec	5.0 nsec
Fall Time	2.5 nsec	2.2 nsec	5.0 nsec
Duty Cycle	50.1%	49.6%	50.7%
Bit Error Rate	Better than 10^{-10}		



The transmitter power levels given above are Peak Power Levels after optical overshoot. You must use a Peak Power Meter to correctly compare the values given above to those measured on any particular port. If you are measuring power levels with an Average Power Meter, add 3 dBm to the average power measurement to correctly compare the average power values measured to the values listed above (i.e., -33.5 dBm average + 3 dB = -30.5 dBm peak).

EPIM-A and EPIM-X (AUI Port)

The EPIM-A is a DB15 female connector used to attach segments to an external transceiver. The EPIM-X is equipped with dual internal transceivers. It has a DB15 male connector used to attach segments to an AUI cable. Figure A-5 shows both modules.

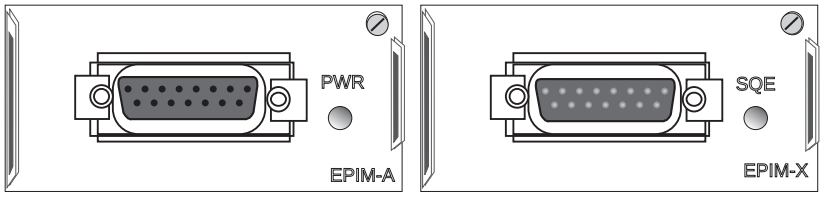


Figure A-5. The EPIM-A and EPIM-X

Table A-4 lists the DB15 pinouts.

Table A-4. EPIM-A and EPIM-x Pinouts

Pin Number	Represents	Pin Number	Represents
1	Logic Ref.	10	Transmit -
2	Collision +	11	Logic Ref.
3	Transmit	12	Receive -
4	Logic Ref.	13	Power (+12Vdc)
5	Receive	14	Logic Ref.
6	Power Return	15	No connection
7	No connection	*Connector Shell	Positive ground
9	Collision -		

*Connector Shell: Protective Ground

Appendix B

Uninterruptible Power Supply (UPS)

Introduction

The SmartSwitch 9000-6 Slot can be connected to a UPS to provide an uninterruptible source of AC power. Two UPS models are available, the Matrix 3000 and the Matrix 5000. Either can be monitored via remote SNMP Management after connecting the UPS to the System Monitor (SM) module.

Connecting a UPS to the System Monitor Module

To connect a UPS to a System Monitor Module, use the RJ45/DB9 adapter and the RJ45 cable included in the cable kit shipped with the System Monitor Module, and follow the steps below.

1. Plug one end of the RJ45 cable into the RJ45/DB9 adapter labeled UPS.
2. Connect the DB9 connector of the UPS adapter into the DB9 receptacle on the UPS unit. See Figure B-1.
3. Connect the free end of the RJ45 cable into the COM2 port on the front of the System Monitor Module. See Figure B-1.

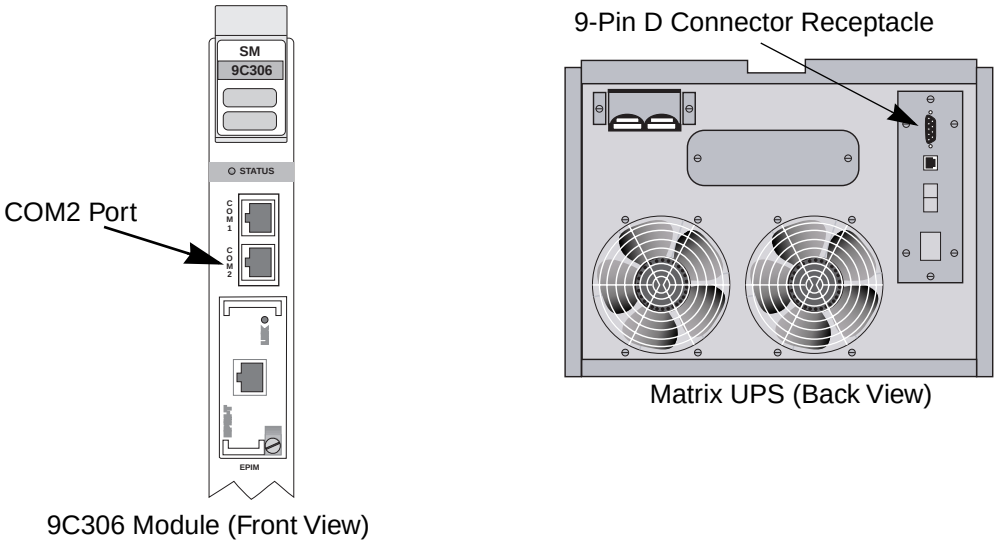


Figure B-1. Connecting the SM Module to a UPS

Configuring COM Port for UPS

After the UPS has been connected to the COM2 port, the COM2 port must be configured for UPS Management. To configure the COM2 port for UPS Management, follow the steps below.

1. Connect the terminal or PC used for local management to the COM1 port on the System Monitor (SM) and press RETURN until the Slot Selection Screen displays.
2. At the Slot Selection Screen, enter 0 (zero) to display the SM Configuration Screen.
3. At the SM Configuration Screen, cursor to the Application Field for the COM2 port.
4. Using the SPACE bar, toggle to the **UPS** option.
5. Using the arrow key, highlight the **SAVE** option and press RETURN.

If you need additional information about configuring the COM ports, refer to the *SmartSwitch 9000-6 Slot Module Local Management User's Guide.*

Monitoring UPS

Information about the operation of the UPS is obtained via Remote SNMP Management or locally by the LCD on the front of the UPS. Refer to the UPS User's Guide, provided by the vendor, for detailed information on the UPS LCD.